

REMARKS

This amendment responds to the final office action mailed March 14, 2006. In the final office action the Examiner rejected claims 15-20 under 35 U.S.C. 102(e) as anticipated by Kumar et al (US 6,551,865).

After entry of this amendment, the pending claims are: claims 15-34.

Claim Amendments

With this response, the applicant has amended claims 15-16 and 18-20, and introduced new claims 21-34.

Independent claim 15, as amended, further recites that, at a conclusion of implanting the second gate region, the second gate region is continuous in a lateral direction and is narrower than the first gate region.

Independent claim 21 recites a method for fabricating a dual gate structure that comprises a series of steps that are executed in a specific sequence, i.e., etching a gate trench followed by forming a first gate region followed by implanting a buffer region followed by implanting a second gate region.

Independent claim 26 recites a method for fabricating a dual gate structure. In particular, the operation of forming a buffer gate region occurs after the formation of the first gate region.

Independent claim 30 recites a method for fabricating a dual gate structure. In particular, the operation of implanting a second gate region occurs after the implantation of the buffer region.

Support for the amended and new claims is found in Figures 3A-3F and 4 and their associated description in the specification of the present application. No new matter is added.

Claim Rejections under 35 U.S.C. 102(e)

The Examiner rejected claims 15-20 under 35 U.S.C. 102(e) as being anticipated by Kumar et al. The applicant respectfully disagrees and traverses.

Claim 15 recites a fabrication method that involves the superposition of three separate implantation steps, i.e., forming a first gate region at the bottom of a gate trench, implanting a buffer region beneath the first gate region, and implanting a second gate region beneath the

buffer region. In particular, the second gate region is narrower than the first gate region at a conclusion of implanting the second gate region.

In the office action, the Examiner first reads the first gate region of claim 15 upon the p-type region in the predefined place 7A in Figure 6. But the p-type region 7A is clearly narrower than the first gate region 3, which the Examiner reads upon the second gate region of claim 15. To contend that Kumar teaches the feature that the second gate region is narrower than the first gate region, the Examiner then mistakenly reads the first gate region of claim 15 upon the second gate region 7, which is clearly different from the p-type region 7A.

According to all the embodiments of Kumar, the p-type region 7A and the second gate region 7 are formed by two separate ion implantations, both of which occur **after** the formation of the first gate region 3. See, e.g., col. 9, lines 48-52 in connection with Figure 4 and col. 12, lines 38-44 in connection with Figure 13. In other words, neither the p-type region 7A nor the second gate region 7 exists at the conclusion of forming the first gate region 3 of Kumar.

Therefore, claims 15-20 are not anticipated by Kumar.

Generally, Kumar teaches a **bottom-up** method of fabricating a silicon carbide semiconductor device such as a JFET. In particular, the method comprises the steps of “

forming a first gate region (3) in a surface portion of the semiconductor layer (2), ...;
forming a channel layer (5) of the first conductivity type on the semiconductor layer (2) and the first gate region (3);
forming a source region (6) of the first conductivity type in the channel layer (5), ...;
forming a second gate region (7) in a surface portion of the channel layer (5), ...;” (adapted from claims 1 and 11 of Kumar).

These steps are executed in a specific temporal order, i.e., the formation of the first gate region 3 being followed by the formation of the channel layer 5 being followed by the formation of the source region 6 being followed by the formation of the second gate region 7. As shown in Figures 2 to 16 of Kumar, the first gate region 3 is always beneath the source region 6 and the source region 6 is always beneath the second gate region 7.

In contrast, embodiments of the present application are directed to a **top-down** fabrication method. For example, as shown in Figure 4, the buffer region is formed (425) after the formation of the first gate region (415) and the second gate region is formed (435) after the formation of the buffer region (425).

Since each of the independent claims 21, 26, and 30 is directed to a fabrication method whose steps are executed in a temporal order that is, at least in part, opposite to that of Kumar's method, claims 21-34 are not anticipated by Kumar.

In light of the above amendments and remarks, the Applicant respectfully requests that the Examiner reconsider this application with a view towards allowance. The Examiner is invited to call the undersigned attorney at (650) 843-4000, if a telephone call could help resolve any remaining items.

Respectfully submitted,

Date: September 12, 2006



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